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# Inorganic nanoparticles: Possible solution for different problems

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The application of nanosized inorganic UV filters in cosmetic field is limited by their high photocatalytic properties that could induce the degradation or dangerous transformation of the organic molecules in sunscreen formulations. To overcome this problem and simultaneously enlarge the window of filter's absorption, we propose the growth of bismuth titanates  $\text{Bi}_x\text{Ti}_y\text{O}_z$  into mesoporous silica nanoparticles (MSN). We investigated the chemical-physical properties by means of XRPD, TEM, UV-vis spectroscopy,  $\text{N}_2$  physisorption, XPS, and SF-ICP-MS analysis, while the influence on the environment was evaluated through photocatalytic tests. The growing process of this new nanosystem is discussed underlining the key role of the  $\text{Bi}^{3+}$  ion that, acting as a low-melting point agent for the silica framework, led to a self-sealing mechanism. The excellent UV shielding properties combined with a radical suppression of the photocatalytic activity make the proposed nanosystem a perfect candidate for the development of the next generation nanomaterials for sunscreen formulations.